



EASTERN UNIVERSITY, SRI LANKA
DEPARTMENT OF MATHEMATICS
FIRST EXAMINATION IN SCIENCE - 2010/2011
SECOND SEMESTER - (June, 2013)
CC 106 – BIO STATISTICS



Answer all questions

Time: One hour

Statistical tables and calculators will be provided

01. (a) A student has collected the following data to understand the length (X , in cm) of newly introduced species of lady's finger.

Classes of length	Frequency (f)
$0 < X \leq 10$	10
$10 < X \leq 20$	20
$20 < X \leq 30$	30
$30 < X \leq 40$	25
$40 < X \leq 50$	15

Find the mean, median and mode of length of lady's finger of this species.

- (b) Data on diameter (mm) and height (cm) of plants of certain species are given in following table.

Diameter (X)	Height (Y)	X^2	Y^2	XY
2	5	4	25	10
3	7	9	49	21
4	10	16	100	40
5	15	25	225	75
6	20	36	400	120

- (i) Briefly comment on the relationship between the diameter and the height using coefficient of correlation.

(P. T. O.)

[Question 01. (b) continued..]

(ii) Fit a regression model of the form, $Y = \beta_0 + \beta_1 X$, where β_0 and β_1 are arbitrary real constants, for the above data and estimate the height of a plant having the diameter of 7mm.

02. (a) Assume that a certain brand of peas seed show 0.7 probability of germination. Find the probability that at least 9 seed out of randomly selected 10 seeds, will germinate.

(b) Life time of a certain chemical is normally distributed with mean 300 days and standard deviation of 10 days. What is the probability that the life time of a selected sample of chemical will be greater than 320 days?

(c) A researcher has collected the following information to compare the mean growth rates (μ_A and μ_B) of certain crop in two mediums A and B.

Quantity	Medium A	Medium B
Sample sizes	5	7
Sample means	30	20
Sample variances	16	9

Check the following hypothesis at 5% significance level, assuming that growth rates in these two mediums are normally distributed and the population variances are the same.

$$H_0: \mu_A \geq \mu_B \quad \text{Vs} \quad H_1: \mu_A < \mu_B.$$